पत्रवेशकाळाच्या सुचनेखविना हे सील उघडू नये
1. ‘बाजीरावाच नातू असेने’ या वाक्प्रचाराचा अर्थ सांगा
   (1) श्रीमंत माणूस
   (2) विशिष्टवचा माणूस
   (3) मिजळस्वार माणूस
   (4) अति लांब्यचा किवा दूर्वचा माणूस

2. कुत्रीन हा शब्द शब्दसिद्धान्ती कोणत्या उपप्रकारातील आहे?
   (1) उपसर्गपट्टीत
   (2) शब्दसाधित
   (3) अप्यास्त
   (4) सामासिक

3. समानांगी शब्दचा जोड़चा लिखा:
   ‘अ’
   अ. कूल
   ब. कावका
   क. डोका
   द. पक्षी
   ‘ब’
   i. एकाक्ष
   ii. अंडज
   iii. सुम
   iv. चक्षु

4. पर्यायी उत्तरे:
   अ  ब  क  द
   (1) iv i ii iii
   (2) ii iii i iv
   (3) iii i iv ii
   (4) i ii iii iv

4. ‘वशिलास असलेली माणसं भीमाव पदवर सहज जलात’, या वाक्प्रचारी उद्देश्यविस्तार आणखा.
   अ. माणसं भीमाव पदवर
   ब. वशिलास असलेली माणसं
   क. वशिला
   द. वशिला असलेली

   (1) फक्त ड बरोबर
   (2) फक्त व बरोबर
   (3) ब अणि ड बरोबर
   (4) फक्त क बरोबर
5. ‘कोल्हा काकड़ीताला गांव’ या म्हणूनच सर्वप्रथम स्पष्टीकरण करणे कोणते?
   (a) जे भिंडालेते तेऩबाट समयाने असलेले.
   (b) वाईट गोट्ट ही शेवटपूर्व वाईटच असते.
   (c) खुद्म भागांते खुश वस्तुनाही भरावलत.
   (d) गर्वित्त माणसाला शेवटी अपमानित होण्याची पाठी येते.

पर्यायी उत्तरे:
(1) फक्त अ आणि ब बरोबर
(2) फक्त ब बरोबर
(3) फक्त क बरोबर
(4) फक्त अ आणि ड बरोबर

प्र. क्र 6 ते 10 उत्तराध्यायी प्रश्न:

आधुनिक काळात सहकार हा जीवनाचा मार्ग झाला आहे. संयुक्तच रूपांतरात सहकार पिकुळ शकते. सहकारातून व्यवसाय सहकारी संस्थानी उभारी घेतली आहे, त्या संस्थानी फार भोडा परिसर विकसना केली आली आहे. जागरूकतिक्रमण प्रक्रियेत उद्योग आणि सेवा यांच्यास म्हणून शेवटी आहे. नकारात्मक वाहतूक त्यांच्यास म्हणून अस्वस्थ आहे, आपली ग्रामीण आणि कृषीधान अर्धचक्षु सहकारी चुंबकीय मूळांचे सशक्त नकारे त्यांची आणि ही अर्धचक्षु सशक्त राहिली तर भारतीय अर्धचक्षुण्याचा क्रम मजबूत गाडू शकतो.

सहकारी श्रेणीत उनिवारांनी शेवटी असलेली काळी थोराच्या पकळ्याची चुंबकीय पूर्णता क्रमांकात आहे असो समजून शेवटी ठेवले. सहकारी चुंबकीय उपवेळा त्याच्यास परिसर विकास करणे अग्रणीही आहे. सहकारी चुंबकीय मध्ये नयी उपवेळा पोशक बदल घडवून आणखी लागेल. त्यामध्ये त्याच्याच स्थापना करत्या तालाबात. त्याच्या स्वतंत्रतेख देखून नवीन दृष्टिकोन विकासाचा पावसाळे परिवर्तनाचे आवश्यक राहिले पाहिजे. अपभ्रंश प्रमाणपणे पेलेल अशी सहकारी तत्त्वांची भक्तता प्राप्त त्याच्या पुण्याच्या बेंटी पाहिजे.

सहकारी चुंबकीय हे नैतिक आणि आध्यात्मिक संदर्भांवर उपर्युक्त होते. चुंबकीय नैतिक व आध्यात्मिक जागरूकतेचा व्यवस्थापन जागरूकता आहे. या क्षेत्रात ज्या महत्त्वाची कार्य केले उदा. श्री. बेकुट्टमधू मेहता, श्री. धनंजय गांडगाव आश्रय उपवेळा अचानक प्रवास नियातली नाही. बाहेर विभूतिच्या वितरे बांधून अपलोकन आणि भागाच्य साक्षी त्याच्यात असते. सहकार प्रणाली आणि प्रणाली श्रेणी क्रियाकलापाचा अभाव आहे. सहकारी संस्थानी सामान्य लागाच गमन आहे. चुंबकीय व्यवस्थाने सहकारी चुंबकीय दृष्टिकोन, चुंबकीय आणि निराकरण रुपांतरण संदर्भांत विकासाची अवस्थाची आपल्यास समजून करण्यास मजबूत राहिली. चुंबकीय व्यवस्था आणि प्रणाली लागाच गमन आहे. त्याच्या चुंबकीय लागाच गमन आहे. प्रभावशाली व्यवस्था निर्माण करण त्याच्या चुंबकीय लागाच गमन मैलिंग तापमान निर्माणकरणाची संधी प्राप्त करण पूर्ण दृष्टिकोन गाडू आहे.
6. सहकारी चढोकणची त्यानंतर विकास करण्यासाठी केल्याकडे तसा दिले फांकिते?
(1) उणिवा
(2) सामग्री
(3) घोटावे
(4) राजकारण

7. सहकारी चढोकणीत कोणत्या जाणियांची उणीच आहे?
(1) राजकीय व भक्तीपय
(2) नैतिक व आध्यात्मिक
(3) साहित्य व सांस्कृतिक
(4) विकास व सुधारावादी

8. सहकारी संस्था सामर्थ्याची लोण्यासाठी कशाची गरज आहे?
(1) प्रणिकित मनुष्यवर्त
(2) आध्यात्मिक संवेदना
(3) सैद्धांतिक माणी
(4) व्यावसायिक उपयोगकर्ते

9. या उतान्याला योग शीर्षक वा
(1) सहकार
(2) समस्या आणि सहकार
(3) सहकार महरी
(4) सहकारी चढोकणीची पुन:संबंधिता

10. सेवा आणि उद्योग वा क्षेत्रांचे कशाचा दूरामभो परिणाम होत आहे?
(1) आरोग्यविकास
(2) भाळवलशाही
(3) जागतिकीकरण
(4) मुक्त आर्थिकविस्तार
11. You could forgive all his **asperities** when he smiled.

Identify the correct meaning of the word underlined.

(1) cruelty  (2) malignity  
(3) malice  (4) roughness

12. Choose the correct word which is the most opposite to the meaning of the underlined word in the sentence.

At night much of the activity comes to **rest**.

(1) cessation  (2) tranquility  
(3) pause  (4) exertion

13. Match the synonyms:

a. agile  
   I. royal
b. human  
   II. permanent
c. majestic  
   III. active
d. perennial  
   IV. gentle

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14. All his efforts proved to be a **mare’s nest** in the long run.

Identify the correct meaning of the underlined.

(1) irrelevant  
(2) unimportant  
(3) worthless  
(4) insincere

15. He is a **man of the world**. His honest advice will help us a lot.

Identify the correct meaning of the underlined.

(1) an important person  
(2) an experienced person  
(3) a social person  
(4) a genius

कँच्वा कामालाडी जागा / SPACE FOR ROUGH WORK
Read the following passage carefully and choose the most correct option given below each question. (Q. No. 16 to 20)

The third great defect of our civilization is that it does not know what to do with its knowledge. Science has given us powers fit for the gods, yet we use them like small children. For example, we do not know how to manage our machines. Machines were made to be man's servants; yet he has grown so dependent on them that they are in a fair way to become his masters. Already most men spend most of their lives looking after and waiting upon machines. And the machines are very stern masters. They must be fed with coal, and given petrol to drink, and oil to wash with, and they must be kept at the right temperature. And if they do not get their meals when they expect them, they grow sulky and refuse to work, or burst with rage, and blow up, and spread ruin and destruction all around them. So we have to wait upon them very attentively and do all that we can to keep them in a good temper. Already we find it difficult either to work or play without the machines, and a time may come when they will rule us altogether, just as we rule the animals.

And this brings me to the point at which I asked, "What do we do with all the time which the machines have saved for us, and the new energy they have given us?" On the whole, it must be admitted, we do very little. For the most part we use our time and energy to make more and better machines; but more and better machines will only give us still more time and still more energy, and what are we to do with them? The answer, I think, is that we should try to become more civilized. For the machines themselves, and the power which the machines have given us, are not civilization but aids to civilization. But you will remember that we agreed at the beginning that being civilized meant making and linking beautiful things, thinking freely, and living rightly and maintaining justice equally between man and man. Man has a better chance today to do these things than he ever had before; he has more time, more energy, less to fear and less to fight against. If he will give his time and energy which his machines have won for him to making more beautiful things, to finding out more and more about the universe, to removing the causes of quarrels between nations, to discovering how to prevent poverty, then I think our civilization would undoubtedly be the greater, as it would be the most lasting that there has ever been.

- CEM JOAD

16. The machines themselves and the powers they have given to us

   a. are nothing but civilization.
   b. are only the aids to civilization.
   c. are only to multiply the production.
   d. are ways to make the people wealthy.

Answer options:
(1) 'a' and 'c' are correct
(2) 'a' and 'd' are correct
(3) 'b' is correct
(4) 'c' is correct
17. The passage is about
a. civilization.
b. only the defects of civilization.
c. making the things more beautiful using the power given by machines.
d. removing the causes of quarrels between the nations and overcoming poverty.

**Answer options:**
(1) Only 'a' is correct  
(2) Only 'b' is correct  
(3) 'a', 'c' and 'd' are correct  
(4) 'b', 'c' and 'a' are correct

18. We use, according to the writer, the powers that are given by science unlike _____.
a. God
b. small children  
c. servants  
d. masters

**Answer options:**
(1) Only 'b' is correct  
(2) Only 'c' is correct  
(3) 'a' and 'b' are correct  
(4) 'c' and 'd' are correct

19. If the machines do not get their meal in time, they will _______.
a. grow sulky and refuse to work.  
b. obey their masters.  
c. burst with rage and blow up.  
d. not cause ruin and destruction.

**Answer options:**
(1) 'a' and 'b' are correct  
(2) 'b' and 'c' are correct  
(3) 'c' and 'd' are correct  
(4) 'a' and 'c' are correct

20. We all agree that being civilized means ________.
a. earning more and more money.  
b. making and linking beautiful things.  
c. grabbing property of others.  
d. maintaining justice equally between men and women.

**Answer options:**
(1) 'b' and 'd' are correct  
(2) 'a' and 'b' are correct  
(3) 'c' and 'd' are correct  
(4) 'd' and 'a' are correct

कथ्व्या कामासाठी जाण / SPACE FOR ROUGH WORK
21. The average C.P.I. inflation declined to 4.9% in 2015 - 16 from 5.9% in 2014 - 15. The average inflation based on the Wholesale Price Index declined to 2.5% in 2015 - 16 from 2.0% in 2014 - 15. The average inflation was 2.9% during April - December 2016.

Which of the statements given above is correct?

(1) a and b
(2) b and c
(3) a and c
(4) All of the above

22. Consider the following statements:

a. Indian planning is indicative economic planning.

b. Indian planning is physical planning.

c. Indian planning is social planning.

Which of the statements given above are correct?

(1) a and b
(2) b and c
(3) a and c
(4) All of the above
23. वस्तुच्या अन्वयत व निर्विन्दौत लाभाच्या ज्ञानाचा कर तयार करावा असे म्हणतात.
(1) सीपा शुल्क (2) अभकारी कर
(3) वस्तुकर्मण कर (4) वस्तु अर्थ देखऱ्या कर

The tax imposed on import and export of commodities is called as ________.
(1) Custom duties (2) Excise duties
(3) VAT (4) GST

24. प्रारंभिक काली वर्षात आत्मनक अन्तर्द्वार बाजार किंमत स्थिर ठेवण्यासाठी ________ द्वारे खुल्या बाजारात तांडूळ व गुलाबी बिंबी केली जाते.
(1) एपू.सी.आप. (2) नाबार्ड
(3) ए.पी.एम.सी. (4) नाफेड

During the last few years ________ used the open market sale of rice and wheat to check market price of these essential food-grains.
(1) FCI (2) NABARD
(3) APMC (4) NAFED

25. स्वतंत्रताप्राप्त काळात भारताची सर्वाधिक निर्यात व विभाग देशकडे होती?
(1) रशिया (2) जपान
(3) ब्रिटन (4) अमेरिका

To which country India exported the most, before independence?
(1) Russia (2) Japan
(3) Britain (4) U.S.A.

26. भारताच्या दहाव्या पंचवार्षिक योजनेत दार्शिक विकास दराचे उद्धार किंती तेलवण्यात आले होते?
(1) 7 टके (2) 8 टके
(3) 9 टके (4) 10 टके

How much annual growth rate was targeted in Tenth Five Year Plan of India?
(1) 7 per cent (2) 8 per cent
(3) 9 per cent (4) 10 per cent
27. In which of the following States, election to the post of Sarpanch is made directly by the people?
   a. Madhya Pradesh
   b. Gujarat
   c. Maharashtra
   (1) Only a
   (2) Only b and c
   (3) a, b and c
   (4) Only a and c

28. Rural Infrastructure Development Fund (RIDF) was instituted by which of the following?
   (1) NABARD
   (2) RBI
   (3) Government of India
   (4) Finance Ministry

29. The United States has recently declared an army called 'Islamic Revolutionary Guard Corps' as a terrorist organisation. Which country is it related to?
   (1) Iran
   (2) Pakistan
   (3) Syria
   (4) Afghanistan

30. Which of the following Lok Sabha constituencies in Maharashtra had largest voters during 2019 general elections?
   (1) Mumbai – South
   (2) Thane
   (3) Gadchiroli – Chimur
   (4) Ratnagiri – Sindhudurg
31. 2019 प्रथम महान स्लोवाकियाच्या राष्ट्रपतीची पदभिनंत्री महिला राष्ट्रपतीचे नाव काय?
   (1) Nina Jorge  (2) Medite Fox  
   (3) Zuzana Capatova  (4) Eluna Lars

Who was elected the first woman President of Slovakia in 2019?
   (1) Nina Jorge  (2) Medite Fox  
   (3) Zuzana Capatova  (4) Eluna Lars

32. 2019 हे वर्ष महाराष्ट्रातील तीन नामवर्त अक्षरीय जनानुवात वर्ष १८५० सालाचे होत आहे. ते म्हणजे
   (1) प.ल. देशपांडे – ग.डि. मादगुकर – राजा पारंजपे  
   (2) बाबा अंमे – प.ल. देशपांडे – राजा नवाजे  
   (3) सुधीर फडके – प.ल. देशपांडे – ग.डि. मादगुकर  
   (4) सुधीर फडके – कुमार गंधवर – प्र.के. अंशे

Maharashtra is celebrating birth centenary of three eminent personalities in 2019. They are
   (1) P.L. Deshpande – G.D. Madgulkar – Raja Paranjape  
   (2) Baba Ante – P.L. Deshpande – Raja Nawathe  
   (3) Sudhir Phadke – P.L. Deshpande – G.D. Madgulkar  
   (4) Sudhir Phadke – Kumar Gandharva – P.K. Atre

33. 2019 हे वर्ष __________ हा देशिहासिक पट्टनचे शताब्दी वर्ष आहे.
   (1) लॉव हे भारतीय होममूल सोसाइटीच्या स्थापना  
   (2) दिएकंडी मंडळले कारगृहात हडपारी  
   (3) मौलाना सत्याग्रह  
   (4) जालीमनवला बाग हत्याकांड

2019 is the centenary year of the historical event of ________
   (1) Formation of Indian Home Rule Society in London  
   (2) Deportation of Tilak to Mandalay Jail  
   (3) Salt Agitation  
   (4) Jalianwala Bagh Massacre

34. 2019 प्रथम भारतीय पदभिनंत्री लोकालपती महिला नियुक्ती करण्यात आली?
   (1) न्यायमूर्ति दीपक मिश्रा  (2) न्यायमूर्ति दिलंग भोसले  
   (3) न्यायमूर्ति अजयकुमार त्रिपाठी  (4) न्यायमूर्ति पिंकीचंद्रा घोष

Who was appointed the first Lokpal of India in 2019?
   (1) Justice Dipak Mishra  (2) Justice Dilip Bhosale  
   (3) Justice Ajaykumar Tripathi  (4) Justice Pinaki Chandra Ghose
35. What are the types of droughts as per 'Krishi Ayog' of India?
   b. Meteorological drought, Hydrological drought.
   c. Agricultural drought, Intense drought, Hydrological drought.
   d. Normal drought, Intense drought, Agricultural drought.

Which of the statements given above is/are correct?
(1) Only a  (2) Only b and c  
(3) Only a and b  (4) Only d

36. Sardar Sarovar will provide water for irrigation to which of the following states?

(1) Gujarat – Madhya Pradesh
(2) Maharashtra – Gujarat
(3) Gujarat – Rajasthan
(4) Rajasthan – Punjab

Kavach Kamasaathi Janya / SPACE FOR ROUGH WORK
37. Write the name of social reformer who was impressed by writings of Thomas Paine.

(1) Gopal Ganesh Agarkar  (2) Dr. Babasaheb Ambedkar
(3) Justice Mr. Ranade  (4) Mahatma Jyotirao Phule

38. Who resigned from the post of Finance Minister of India to support the Sanyuktta Maharashtra movement?

(1) Yeshwantrao Chavan  (2) Baiasaheb Kher
(3) C.D. Deshmukh  (4) K.M. Pannikar

39. A severe earthquake occurred at Koyna on.

(1) 30 September, 1963  (2) 26 July, 1965
(3) 11 March, 1966  (4) 11 December, 1967

40. Which of the following statements is/are incorrect?

a. Pavnar city is located on the bank of river Katepurna.
b. The origin of river Wainganga is at Betul.
c. Terna is a tributary of river Manjira.

(1) Only a  (2) Only b
(3) a and b  (4) a, b and c
41. Two equal forces acting at a right angle having resultant $\sqrt{32}$, then find magnitude of each force.

(1) 2
(2) 4
(3) 8
(4) 16

42. Two unlike parallel forces, each of magnitude 50 kN are 200 mm apart from each other. What will be the magnitude of moment of couple formed by these two forces?

(1) 5 kN m
(2) 10 kN m
(3) 20 kN m
(4) 0

43. When two surfaces are in contact with each other during motion, it requires more force even on horizontal surface to move which is due to friction. But frictional force does not depend on __________.

(1) Normal reaction from surface
(2) Force tending to cause motion
(3) Roughness of surface
(4) Area of contact between two surfaces

44. The ratio of static friction to dynamic friction is always

(1) equal to one
(2) less than one
(3) greater than one
(4) None of the above

45. What is the moment of inertia of a quarter circle with respect to x-axis which is passing through the center of a circle whose radius is 20 mm?

(1) 3.14 cm$^4$
(2) 0.878 cm$^4$
(3) 0.785 cm$^4$
(4) 0.393 cm$^4$

ना कामशादी ज्ञान / SPACE FOR ROUGH WORK P.T.O.
46. In three dimensional analysis, equilibrium of parallel forces along x-axis requires

(1) $\sum F_x = 0$, $\sum F_y = 0$, $\sum F_z = 0$

(2) $\sum F_x = 0$, $\sum M_x = 0$, $\sum M_y = 0$

(3) $\sum F_x = 0$, $\sum M_y = 0$, $\sum M_z = 0$

(4) $\sum F_x = 0$, $\sum F_y = 0$, $\sum M_z = 0$

47. If a body acted upon by a number of co-planar non-concurrent forces it may

(1) rotate about itself without moving

(2) move in any one direction rotating about itself

(3) be completely at rest

(4) All of the above

48. Radial component of velocity and acceleration in curvilinear motion are

(1) $r$ and $r - r (\dot{\theta})^2$

(2) $r \dot{\theta}$ and $r \ddot{\theta} + 2 \dot{r} \dot{\theta}$

(3) $r$ and $r \dot{\theta}$

(4) $\dot{r}$ and $r \ddot{\theta}$

49. If the horizontal range of a projectile is maximum then the angle of the projectile must be _________ with horizontal.

(1) 90°

(2) 75°

(3) 45°

(4) 30°

50. “The rate of change of momentum is directly proportional to the impressed force, and takes place in the same direction, in which the force acts”. This is the statement of

(1) D’Alembert’s principle

(2) Newton’s first law of motion

(3) Newton’s second law of motion

(4) Newton’s third law of motion
51. Ball A of mass 1 kg moving with velocity of 2 m/s strikes directly on a ball of mass 2 kg rest. What are the velocities of the two balls after impact if coefficient of restitution is 0.5?

(1) 0 and 1 m/s  
(2) 1 and 2 m/s  
(3) 2 and 2 m/s  
(4) 1 and 1 m/s

52. A ball which is thrown upward at an angle ‘α’, returns to the ground describing a parabolic path during its flight

(1) Vertical component of velocity remains constant  
(2) Horizontal component of velocity remains constant  
(3) Speed of the ball remains constant  
(4) Kinetic energy of the ball remains constant

53. What will be the deformation of the spring if a block of weight 100 N is kept on it. Take stiffness of spring 1000 N/m.

(1) 10 m  
(2) 0.1 m  
(3) 0.01 m  
(4) 1 m

54. If $u_1$ and $u_2$ are the velocities of two moving bodies in the same direction before impact and $V_1$ and $V_2$ are their velocities after impact, then coefficient of restitution is given by

(1) $\frac{V_1 - V_2}{u_1 - u_2}$  
(2) $\frac{V_2 - V_1}{u_1 - u_2}$  
(3) $\frac{u_1 - u_2}{V_1 - V_2}$  
(4) $\frac{u_2 + u_1}{V_2 + V_1}$
55. How much is the carbon content (%) in high tensile steel?
   (1) 0.7 - 0.9%  (2) 0.3 - 0.5%  (3) 0.6 - 0.8%  (4) 0.8 - 1.0%

56. How much is the measuring capability of digital planimeter w.r.t. an ordinary planimeter?
   (1) 10 times larger  (2) 2 times larger  (3) 20 times larger  (4) 100 times larger

57. Type of surveying in which the shape of the earth is taken into account is known as
   (1) Topographical survey  (2) Cadastral survey  (3) Geodetic surveying  (4) Plane surveying

58. Out of the following, which is clay stone with vesicular texture?
   (1) Laterite  (2) Sandstone  (3) Limestone  (4) Granite

59. What is carbon content (%) in mild steel?
   (1) 2.0 - 3.0  (2) 0.5 - 0.8  (3) 0.05 - 0.1  (4) 0.15 - 0.3

60. Out of the following, which is the component of G.I.S.?
   (1) Computer system  (2) Software  (3) Data management  (4) All of the above

61. By which rule, the total error in latitude and departure is distributed in proportion to the lengths of the traverse legs?
   (1) Transit Rule  (2) Bowditch’s Rule  (3) Third Rule  (4) Simpson’s Rule

62. What is the minimum live load (N/m²) of floor area to be considered for residential buildings?
   (1) 3000  (2) 4000  (3) 2000  (4) 5000

63. The component in cement which has the property of hydrating rapidly and is responsible to provide not only early strength but also the ultimate strength is
   (1) Dicalcium Silicate  (2) Tricalcium Silicate  (3) Tricalcium Aluminate  (4) Tetra Calcium Alumino ferrite

64. In Ordinary Portland cement the percentage of lime constitutes:
   (1) 60 to 67  (2) 50 to 57  (3) 74 to 78  (4) 51 to 56
65. In a governor, the vertical distance which the sleeve travels due to change in equilibrium speed is called ________.

(1) Sleeve distance
(2) Sleeve fit
(3) Sleeve height
(4) Sleeve lift

66. The thermal conductivity of ________ varies with square root of the absolute temperature.

(1) solid
(2) liquid
(3) gas
(4) None of the above

67. Name the boiler which can generate superheated steam without additional accessories.

(1) Cornish boiler
(2) Locomotive boiler
(3) Lancashire boiler
(4) Cochran boiler

68. The power transmitted by belt drive is designed on the basis of ________.

(1) angle of lap on the smaller pulley
(2) angle of lap on the larger pulley
(3) average angle of lap of two pulleys
(4) angle of lap of the driver pulley whether smaller or larger

69. A four bar chain has

(1) all turning pairs
(2) all sliding pairs
(3) one turning pair and others are sliding pairs
(4) one sliding pair and others are turning pairs
70. in low carbon steels, the presence of small quantities of sulphur improves
   (1) Weldability (2) Formability
   (3) Machinability (4) Hardenability

71. ___________ is the property of a material to resist fracture due to high impact
    blows like hammer blows.
   (1) Fatigue
   (2) Creep
   (3) Toughness
   (4) Malleability

72. The casting produced by forcing molten metal under pressure into a permanent
    metal mould is called as __________ casting.
   (1) sand mould
   (2) slug
   (3) die
   (4) All of the above

73. The process of removal of metal by rotating the cutter in the direction of travel of
    work piece is called
   (1) up milling
   (2) down milling
   (3) straddle milling
   (4) saw milling

74. ___________ is the process by which great pressure is applied to a heated metal
    billet or blank causing it to flow through a restricted orifice.
   (1) Extrusion
   (2) Hot rolling
   (3) Tubing
   (4) Cold rolling

काल्याण कागळाळी जागा / SPACE FOR ROUGH WORK
75. Find the current through resistor $R_4$ in the figure given below:

\[ R_1 = 4 \, \Omega \quad R_3 = 4/3 \, \Omega \]

\[ E = 12 \, V \]

\[ R_1 = 8 \, \Omega \quad R_4 = 6 \, \Omega \]

(1) 0.6 A  (2) 0.8 A  (3) 0.5 A  (4) 1.0 A

76. Number of equations required to be analyzed in a given network by nodal analysis is equal to

(1) The number of independent loops
(2) One less than the number of loops
(3) The number of nodes
(4) One less than the number of nodes

77. Two capacitors of 80 \( \mu \text{F} \) and 50 \( \mu \text{F} \) are connected in series. Find the maximum energy stored in the circuit when 200 V at 50 Hz are applied across the series circuit.

(1) 1230 J  (2) 1.23 J  (3) 123 J  (4) 980 J

78. The admittance of a branch with $Z = 3 + j4 \, \text{ohm}$ in an ac circuit is

(1) $(0.3 - j0.25) \, \text{mho}$  (2) $(0.6 + j0.8) \, \text{mho}$
(3) $(0.25 - j0.3) \, \text{mho}$  (4) $(0.6 - j0.8) \, \text{mho}$

79. Which of the following 3-phase systems is sometimes also called as 3-phase, 4-wire system?

(1) 3-phase star-connected
(2) 3-phase delta-connected
(3) 3-phase zig-zag connected
(4) any 3-phase system
80. Three similar resistors are connected in star across 400 V, 3-phase lines. The line current is 5 A. Calculate the value of each resistor.

(1) 46.2 Ω  
(2) 80 Ω  
(3) 138.40 Ω  
(4) None of the above

81. In a transformer, maximum voltage regulation occurs at ___________.

(1) leading power factor of the load  
(2) lagging power factor of the load  
(3) unity power factor of the load  
(4) None of the above

82. The core of a transformer is assembled with thin laminated sheets so as to

(1) Reduce hysteresis loss  
(2) Reduce eddy current loss  
(3) Reduce both hysteresis and eddy current losses  
(4) ensure good magnetic coupling between primary and secondary winding.

83. When a transformer is operating on no load the primary applied voltage is approximately balanced by

a. Primary induced emf  
b. Secondary induced emf  
c. Terminal voltage across the secondary  
d. Voltage drop across the resistance and reactance

Which statement/s is/are correct?

(1) Only a  
(2) Only a and b  
(3) Only c and d  
(4) Only d

84. The resistance and reactance in a series R-C circuit are 7.5 Ω each. In this circuit

(1) voltage leads the current by 45°  
(2) current leads the voltage by 45°  
(3) voltage leads the current by 60°  
(4) current leads the voltage by 15°

कक्ष्या कामासाठी जाणावे / SPACE FOR ROUGH WORK
85. Find the Eigen values and Eigen vectors of the following matrix

\[
\begin{bmatrix}
-5 & 2 \\
2 & -2
\end{bmatrix}
\]

(1) \((-1, -6) \begin{bmatrix} 1 \\ 2 \end{bmatrix} \begin{bmatrix} 2 \\ -1 \end{bmatrix} \)
(2) \((1, 6) \begin{bmatrix} 1 \\ -2 \end{bmatrix} \begin{bmatrix} -2 \\ 1 \end{bmatrix} \)
(3) \((1, -6) \begin{bmatrix} -1 \\ 2 \end{bmatrix} \begin{bmatrix} 2 \\ -1 \end{bmatrix} \)
(4) \((-1, 6) \begin{bmatrix} 1 \\ 2 \end{bmatrix} \begin{bmatrix} 2 \\ 1 \end{bmatrix} \)

86. Which of the following is the inverse of the matrix \( A = \begin{bmatrix} 3 & 0 \\ 1 & 2 \end{bmatrix} \)

(1) \( \begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix} \)
(2) \( \begin{bmatrix} 0 & 1 \\ 1 & 6 \end{bmatrix} \)
(3) \( \begin{bmatrix} 1 & -1 \\ 3 & -6 \end{bmatrix} \)
(4) \( \begin{bmatrix} 1 & 0 \\ 3 & 2 \end{bmatrix} \)

87. Pick up the incorrect statement from the following options.
If \( A \) is Coefficient Matrix, \( K \) is Augmented Matrix and \( R \) is the Rank of Matrix
(1) If \( R (A) \neq R (K) \), the equations are inconsistent and have no solutions
(2) If \( R (A) = R (K) = n \), the equations are consistent and have unique solutions
(3) If \( R (A) = R (K) < n \), the equations are consistent and have infinite number of solutions
(4) If \( R (A) = R (K) > n \), the equations are consistent and have infinite number of solutions

88. If \( u = x^y \) choose the correct option

(1) \( \frac{\partial^3 u}{\partial x^2 \partial y} = \frac{\partial^3 u}{\partial x \partial y \partial x} \)
(2) \( \frac{\partial^3 u}{\partial x \partial y^2} = \frac{\partial^3 u}{\partial y \partial x \partial y} \)
(3) \( \frac{\partial^3 u}{\partial x \partial y^2} = \frac{\partial^3 u}{\partial x^2 \partial y} \)
(4) \( \frac{\partial^2 u}{\partial x^2} = \frac{\partial^2 u}{\partial y^2} \)
89. A function \( f(x, y) \) is said to be homogeneous of degree \( n \) in the variables \( x \) and \( y \) if it can be expressed in the form

\[
(1) \quad x^p \phi \left( \frac{y}{x} \right) \\
(2) \quad y^n \phi \left( \frac{x}{y} \right) \\
(3) \quad \text{Both (1) and (2)} \\
(4) \quad \text{None of the above}
\]

90. Choose the correct option for the following sentences.

a. A function \( f(x, y) \) is said to have a maximum value at \( x = a, y = b \) if
\[
\frac{f(a, b)}{f(a + h, b + k)} > \frac{f(a, b)}{f(a + h, b + k)}
\]

b. A function \( f(x, y) \) is said to have a maximum value at \( x = a, y = b \) if
\[
\frac{f(a, b)}{f(a + h, b + k)} < \frac{f(a, b)}{f(a + h, b + k)}
\]

(1) Both a and b are wrong
(2) Both a and b are true
(3) a is true, b is wrong
(4) b is true, a is wrong

91. Match the following:

a. \[
\frac{\partial^2 u}{\partial t^2} = C \frac{\partial^2 u}{\partial x^2}
\]

b. \[
\frac{\partial u}{\partial t} = C \frac{\partial^2 u}{\partial x^2}
\]

c. \[
\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0
\]

d. \[
\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = f(x, y)
\]

I. Two-dimensional Poisson equation
II. One-dimensional wave equation
III. One-dimensional heat equation
IV. Two-dimensional Laplace equation

a b c d
(1) II III I IV
(2) II III IV I
(3) IV I III II
(4) IV III II I

कक्ष्या कामासाठी जाणा ; SPACE FOR ROUGH WORK
92. Particular integral of
\[ \frac{d^2y}{dx^2} + 3 \frac{dy}{dx} + 2y = 5 \]
is

(1) \( \frac{2}{5} \)  
(2) \( \frac{1}{5} \)  
(3) \( \frac{5}{2} \)  
(4) \( \frac{3}{2} \)

93. Cauchy's linear differential equation \( x^n \frac{d^ny}{dx^n} + a_1 x^{n-1} \frac{d^{n-1}y}{dx^{n-1}} + \ldots + a_n y = f(x) \) can be reduced to linear differential equation with constant coefficient by using substitution

(1) \( x = e^z \)  
(2) \( y = e^z \)  
(3) \( z = e^x \)  
(4) \( z = e^y \)

94. To reduce the differential equation \((x + 5)^2 \frac{d^2y}{dx^2} - (x + y) \frac{dy}{dx} + y = 10x + 8\) to linear differential equation with constant coefficient, the substitution is

(1) \( x + 5 = e^{-z} \)  
(2) \( x + 5 = e^z \)  
(3) \( z = e^{x+5} \)  
(4) \( z = x + 5 \)

95. Given that

\[
\begin{array}{|c|c|c|c|c|c|c|}
\hline
x & 4 & 4.2 & 4.4 & 4.6 & 4.8 & 5.0 & 5.2 \\
\hline
\log x & 1.3863 & 1.4351 & 1.4816 & 1.5261 & 1.5686 & 1.6094 & 1.6484 \\
\hline
\end{array}
\]

Evaluate \( \int_4^{5.2} \log x \, dx \) by Trapezoidal Rule.

(1) \( 1.827887 \)  
(2) \( 1.827655 \)  
(3) \( 1.827867 \)  
(4) \( 1.82780 \)

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P.T.O.
96. Given that

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<td>1</td>
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<td>2</td>
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<tr>
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<tr>
<td>6</td>
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Evaluate $\int_0^6 \frac{dx}{1 + x^2}$ using Simpson’s $\frac{3}{8}$ rule.

(1) 1.3574
(2) 1.3569
(3) 1.3576
(4) 1.3571

97. The triple integral is used to compute

(1) Volume
(2) Area
(3) Both Volume and Area
(4) None of the above
98. Evaluate
\[ \int_0^1 \int_0^1 \int_0^{1-x} x \, dz \, dx \, dy \]
\[ \begin{align*}
(1) & \quad \frac{2}{35} \\
(2) & \quad \frac{4}{35} \\
(3) & \quad \frac{4}{17} \\
(4) & \quad \frac{2}{17}
\end{align*} \]

99. Change the order of integration in
\[ \int_0^a \int_y^a \frac{x}{x^2 + y^2} \, dx \, dy \]
\[ \begin{align*}
(1) & \quad \int_0^a \int_0^x \frac{x}{x^2 + y^2} \, dy \, dx \\
(2) & \quad \int_0^a \int_0^x \frac{x}{x^2 + y^2} \, dy \, dx \\
(3) & \quad \int_0^a \int_0^y \frac{x}{x^2 + y^2} \, dy \, dx \\
(4) & \quad \int_0^a \int_0^y \frac{x}{x^2 + y^2} \, dy \, dx
\end{align*} \]

100. Evaluate the following integral
\[ \int_0^a \int_0^a \int_0^a (xy + xz + yz) \, dx \, dy \, dz \]
\[ \begin{align*}
(1) & \quad \frac{3}{4} a^3 \\
(2) & \quad \frac{2}{3} a^5 \\
(3) & \quad \frac{3}{4} a^5 \\
(4) & \quad \frac{5}{3} a^3
\end{align*} \]

कक्ष्या कामासाठी जगा / SPACE FOR ROUGH WORK  P.T.O.
नमुना प्रश्न

प्र. क्र. 201. सही चाल नट कल्पनावादी कोणी मूलतः प्रस्तुत केले होते?
(1) स्वयं स्वयं स्वयं स्वयं (2) इशिराचंद्र विद्यासागर
(3) राजा राममोहन राम (4) गोपालकुमार गोपाल
हा प्रश्नाचे योग उत्तर “(३) राजा राममोहन राम” असे आहे. त्यातून त्याचे उत्तर “(३)” होईल, याचे नाव खालीलप्रमाणे प्रस्तुत क्र. 201 सर्वसाधारण उत्तर-क्रमांक “३” हे त्याच्या पूर्णांकेच्या छायाचित्र करून दाखविले आहे.

प्र. क्र. 201. (१) (२) (३) (४)
अशा पद्धतीने प्रस्तुत प्रस्तुतकारील प्रश्नेत प्रश्नाचा तुमचा उत्तर-क्रमांक हा तुम्हाला स्वतंत्रत्वपात्र व्यक्त म्हणून तरीकेत त्याच्या पूर्णांकेच्या छायाचित्र करून दाखविले. छायाचित्र फक्त काळजी शाईचे वॉलपेपर वापरते, पेंसिल वा शाईचे पेन वापर नये.